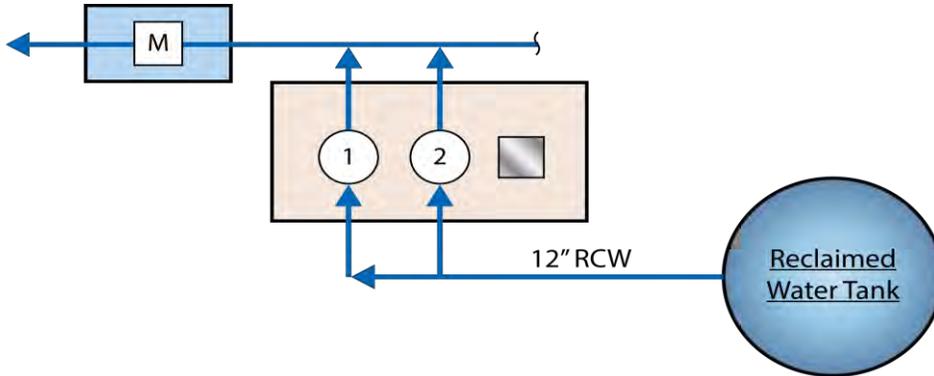


**Town of Cary Reclaimed Water System
Facility Worksheet
PUMP STATIONS**

Facility: South Cary Reclaimed Water Pump Station
Date: 2/28/13 **Inspected By:** JSG

Pump Station Schematic:

Year Built 2012
Drawing Provided **Yes** **No**



Pump Configuration: Vertical Turbine Can **Pump Curves Available?** yes
Suction Supply: Effluent **Flow Meter Location:** Vault/8" Magmeter
Pump Control: System Pressure **Meter Type / Model:** 8" magmeter/KROHNE
Pump Centerline Elevation: 301 **Date Last Calibrated:** _____
Source: Verbal/as-built

Overall condition: Excellent Good Fair Poor Needs Repair Needs Replacement

Detailed Pump Information

Source of Information: Pump Curve/2001 data
 (model, as-built, visual inspection, verbal)

Pump No.	Serial No.	Manuf.	Model	HP	Design Flow		Design Head (ft)	RPM / Stages
					gpd	mgd		
1	0101NSH00032-1	Ingersoll Dresser	10 EMM	60	475	0.684	318	1760/7
2	0101NSH00032-2	Ingersoll Dresser	10 EMM	60	475	0.684	318	1760/7

Capacity of Pump Station:

Total Capacity: 1.4 mgd
Firm Capacity: 0.684 mgd

Control Set-points: Automatic (automatic / manual)
PSI (feet, psi, time of day)

CPZ	Pump No.	On Set-point	Off Set-point	Always On
Lead	1	105 PSI	125 PSI	
Lag 1	2	100 PSI	115 PSI	
Lag 2	Future			

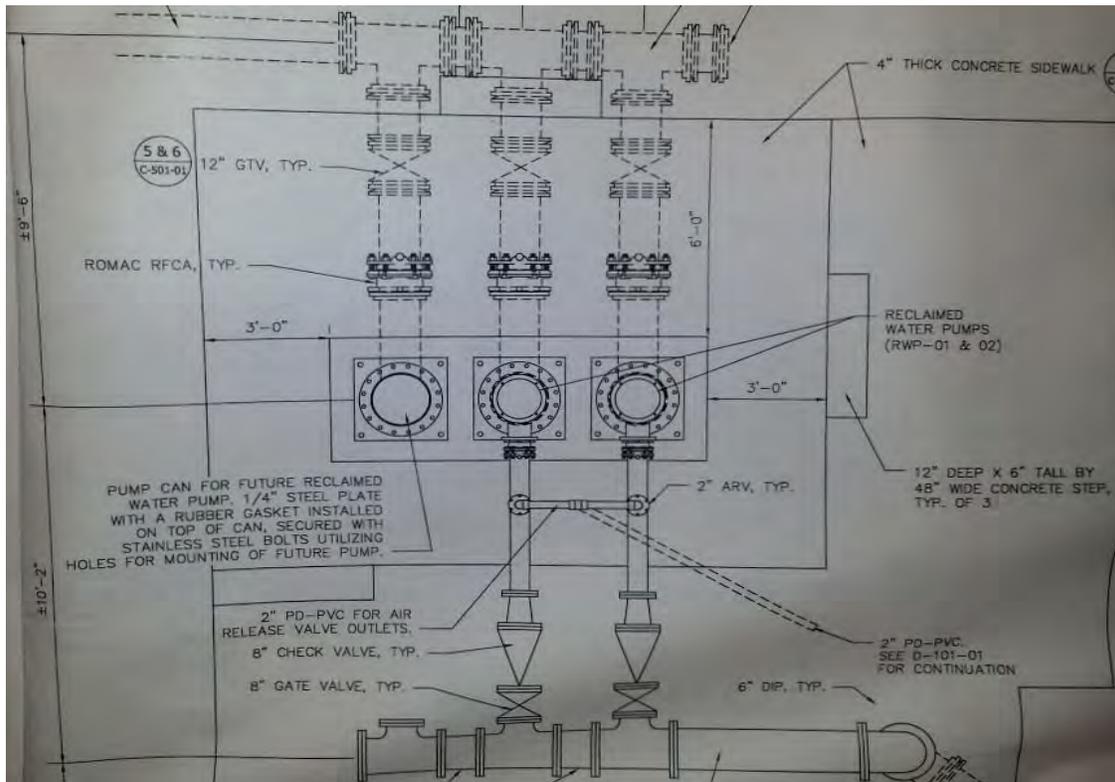
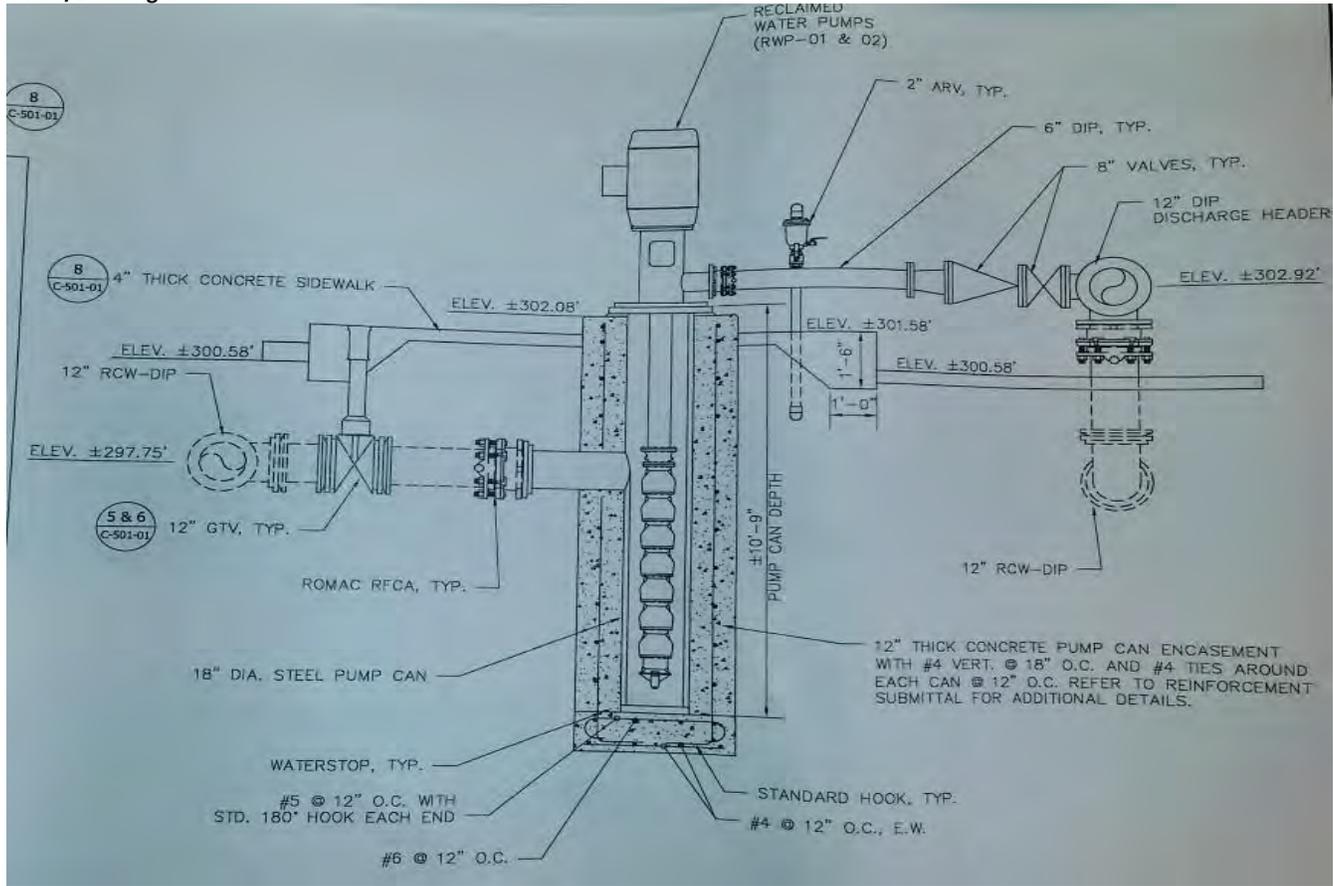
Town of Cary Reclaimed Water System
Facility Worksheet
PUMP STATIONS

Photographs:



**Town of Cary Reclaimed Water System
Facility Worksheet
PUMP STATIONS**

Plans/Drawings:



Town of Cary Reclaimed Water System
 Facility Worksheet
 PUMP STATIONS

Pump Curves and Additional Information:

INGERSOLL-DRESSER PUMP CO.
 VERTICAL PUMP DIVISION
 HASTINGS NE.

PERFORMANCE TEST RESULTS

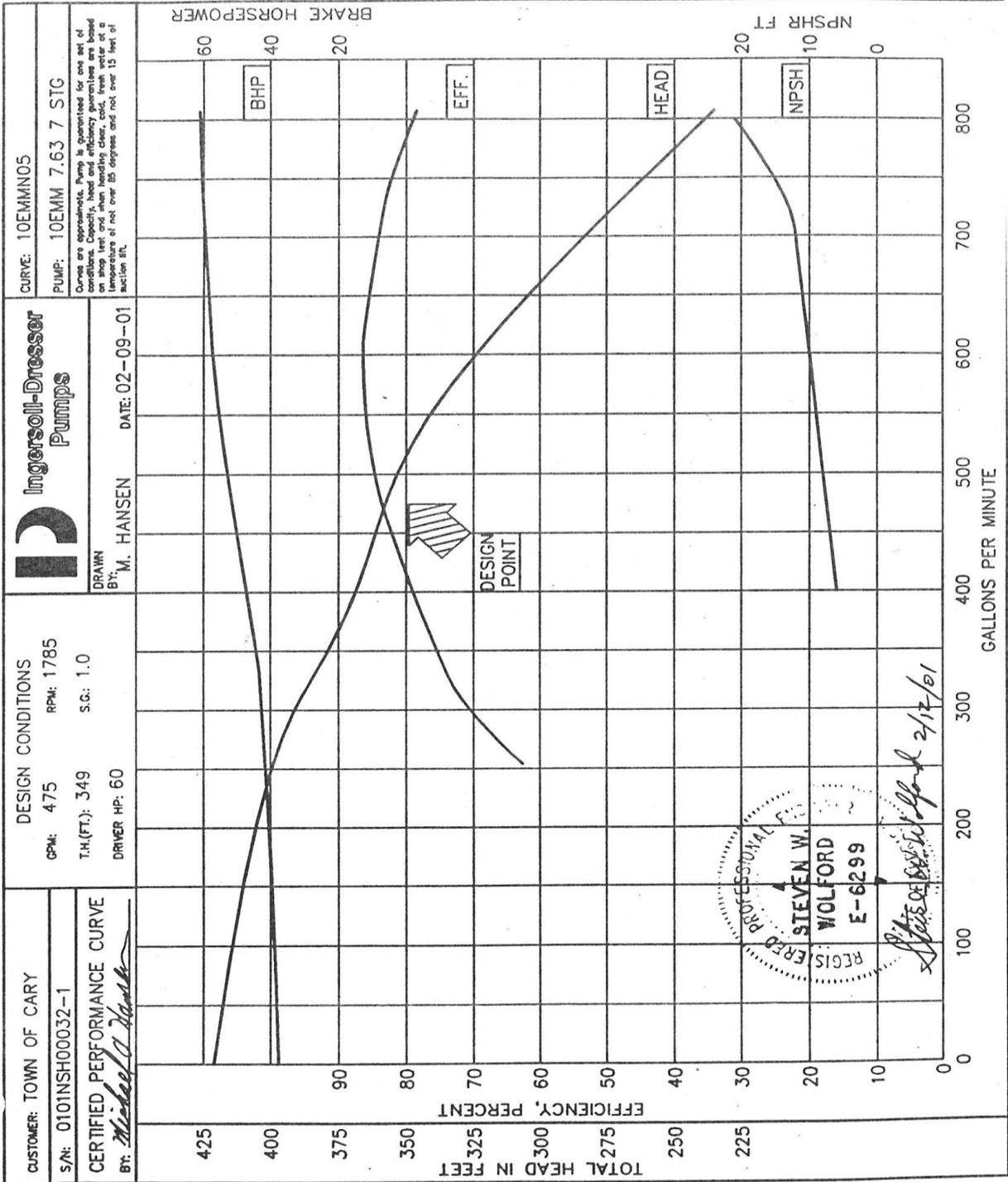
TEST NUMBER:	10EMMN06	BOWL SIZE/TYPE:	10EM
DATE:	02-09-01	BOWL MATERIAL:	CI LINED
TESTED BY:	GL	IMPELLER TYPE/DIA:	M 7.63
TESTED FOR:	TOWN OF CARY	IMPELLER MATERIAL:	C86500
WITNESSED BY:	<i>Steven W. Wolford</i>	IMPELLER SETTING:	.13
CORRECTED RPM:	1785	NUMBER OF STAGES:	7
SERIAL NUMBER:	0101NSH00032-2	FLOW METER SIZE:	6
S.O. NUMBER	SH00032	TEST MOTOR HP/RPM:	75 1800
THRUST CONSTANT:	3.9	TEST COLUMN/SHAFT:	6 /1.50

DATA CORRECTED TO 1785 RPM AND 1.000 SG

FLOW (GPM)	HEAD (FT)	EFF (%)	POWER (HP)	HEAD/STG (FT)	POWER/STG (HP)
0	421.3	0.0	38.3	60.2	5.5
263	399.2	62.0	42.7	57.0	6.1
350	373.7	73.7	44.7	53.4	6.4
394	366.1	77.1	47.3	52.3	6.8
481	354.8	83.0	51.9	50.7	7.4
528	344.7	84.5	54.4	49.2	7.8
597	324.6	85.7	57.1	46.4	8.2
708	277.8	83.5	59.5	39.7	8.5
819	225.4	76.7	60.8	32.2	8.7

**Town of Cary Reclaimed Water System
Facility Worksheet
PUMP STATIONS**

Pump Curves and Additional Information:



Town of Cary Reclaimed Water System
 Facility Worksheet
 PUMP STATIONS

Pump Curves and Additional Information:

INGERSOLL-DRESSER PUMP CO.
 VERTICAL PUMP DIVISION
 HASTINGS NE.

PERFORMANCE TEST RESULTS

TEST NUMBER:	10EMMN05	BOWL SIZE/TYPE:	10EM
DATE:	02-09-01	BOWL MATERIAL:	CI LINED
TESTED BY:	GL	IMPELLER TYPE/DIA:	M 7.63
TESTED FOR:	TOWN OF CARY	IMPELLER MATERIAL:	C86500
WITNESSED BY:	<i>Steven W. Wolford</i>	IMPELLER SETTING:	.13
CORRECTED RPM:	1785	NUMBER OF STAGES:	7
SERIAL NUMBER:	0101NSH00032-1	FLOW METER SIZE:	6
S.O. NUMBER:	SH00032	TEST MOTOR HP/RPM:	75 1800
THRUST CONSTANT:	3.9	TEST COLUMN/SHAFT:	6 /1.50

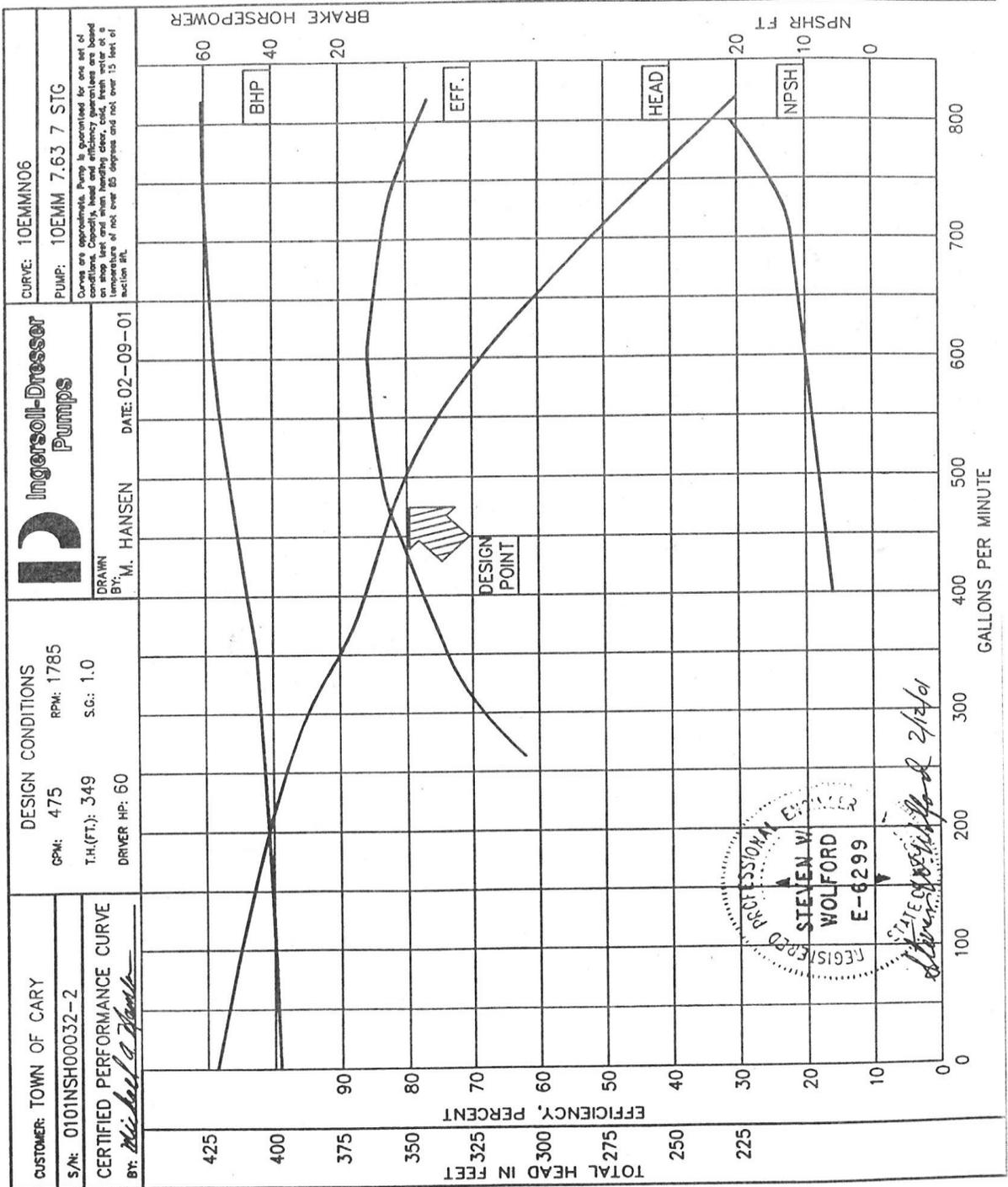
DATA CORRECTED TO 1785 RPM AND 1.000 SG

FLOW (GPM)	HEAD (FT)	EFF (%)	POWER (HP)	HEAD/STG (FT)	POWER/STG (HP)
0	421.1	0.0	37.6	60.2	5.4
254	405.1	62.6	41.5	57.9	5.9
334	381.2	74.2	43.4	54.5	6.2
407	366.9	79.4	47.5	52.4	6.8
478	358.1	83.8	51.6	51.2	7.4
525	348.6	85.5	54.1	49.8	7.7
599	326.9	86.5	57.2	46.7	8.2
721	274.8	83.5	60.0	39.3	8.6
807	235.3	78.4	61.1	33.6	8.7

STEVEN W. WOLFORD
 E-6299
Steven W. Wolford
 2/11/02

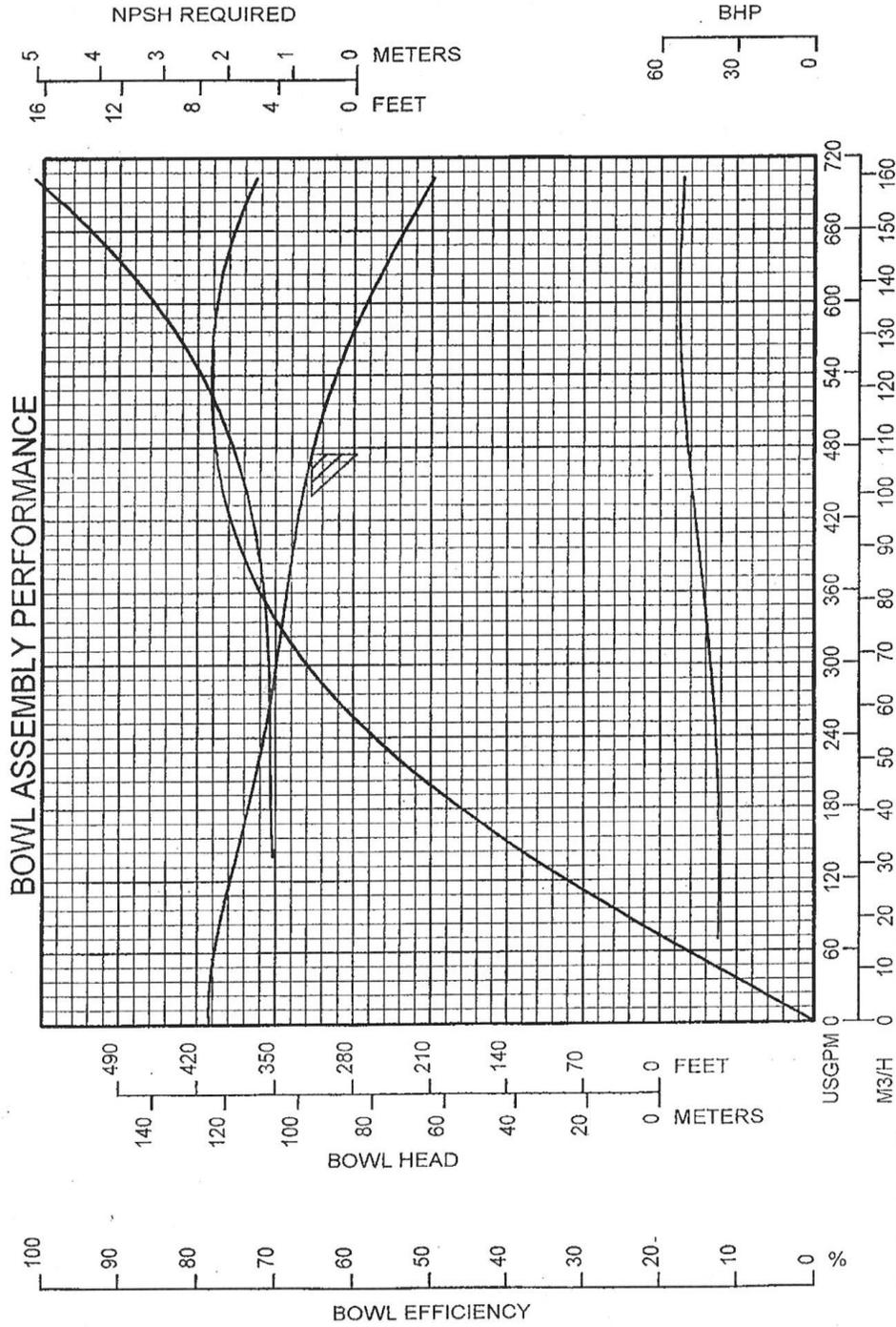
**Town of Cary Reclaimed Water System
Facility Worksheet
PUMP STATIONS**

Pump Curves and Additional Information:



**Town of Cary Reclaimed Water System
Facility Worksheet
PUMP STATIONS**

Pump Curves and Additional Information:



Customer : Town of Cary, North Carolina	Ingersoll-Dresser Pumps	Pump : 10EMM
Project : South Cary Reclaimed Water		Stages : 7
Service : Vertical Pumps		Bowl Mat. : CI/LINED
Date : 9 Oct 2000	Flow (USGPM) : 475.0	Imp. Mat. : STAINLESS STEEL
Impeller : Enclosed	Head (FEET) : 318	SG : 1.00
		RPM : 1760
		Shaft Mat. : 416SS

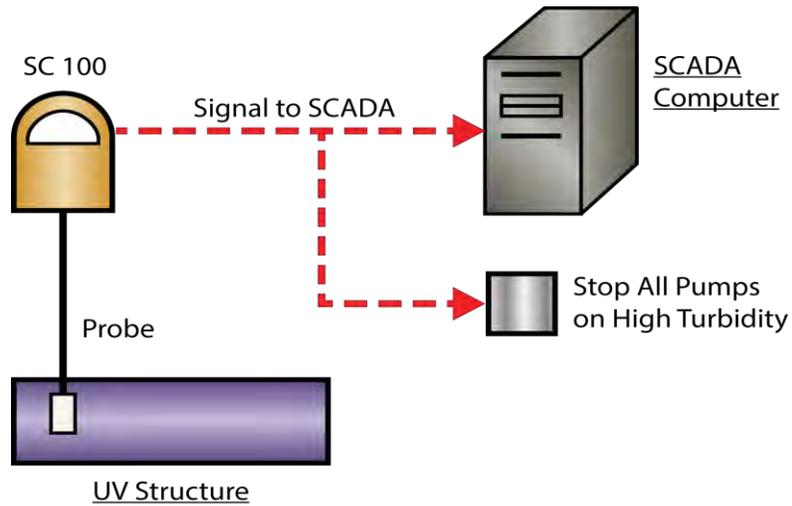
GUARANTEES ARE BASED ON SHOP TEST WITH WARMING CLEAN FRESH WATER AT A TEMPERATURE OF NOT OVER 60 F. CURVES ARE APPROXIMATE. PUMP IS GUARANTEED FOR ONE SET OF CONDITIONS: CAPACITY, HEAD, AND EFFICIENCY.

**Town of Cary Reclaimed Water System
Facility Worksheet
MONITORING EQUIPMENT**

Facility: South Cary Turbidity Monitor
Date: 2/28/13 **Inspected By:** JSG

Information:
HACH sc 100
Controller will receive data from up to two sensors.
Sensors - Solitax Probes
Samples from UV Channel
High Alarm Set Point 8.0 NTU

Schematic:



South Cary Turbidity Monitor

Year Constructed: 2001
Manufacturer: HACH

Overall condition: Excellent Good Fair Poor Needs Repair Needs Replacement

Drawing Provided Yes No

Town of Cary Reclaimed Water System
Facility Worksheet
MONITORING EQUIPMENT

Photographs:



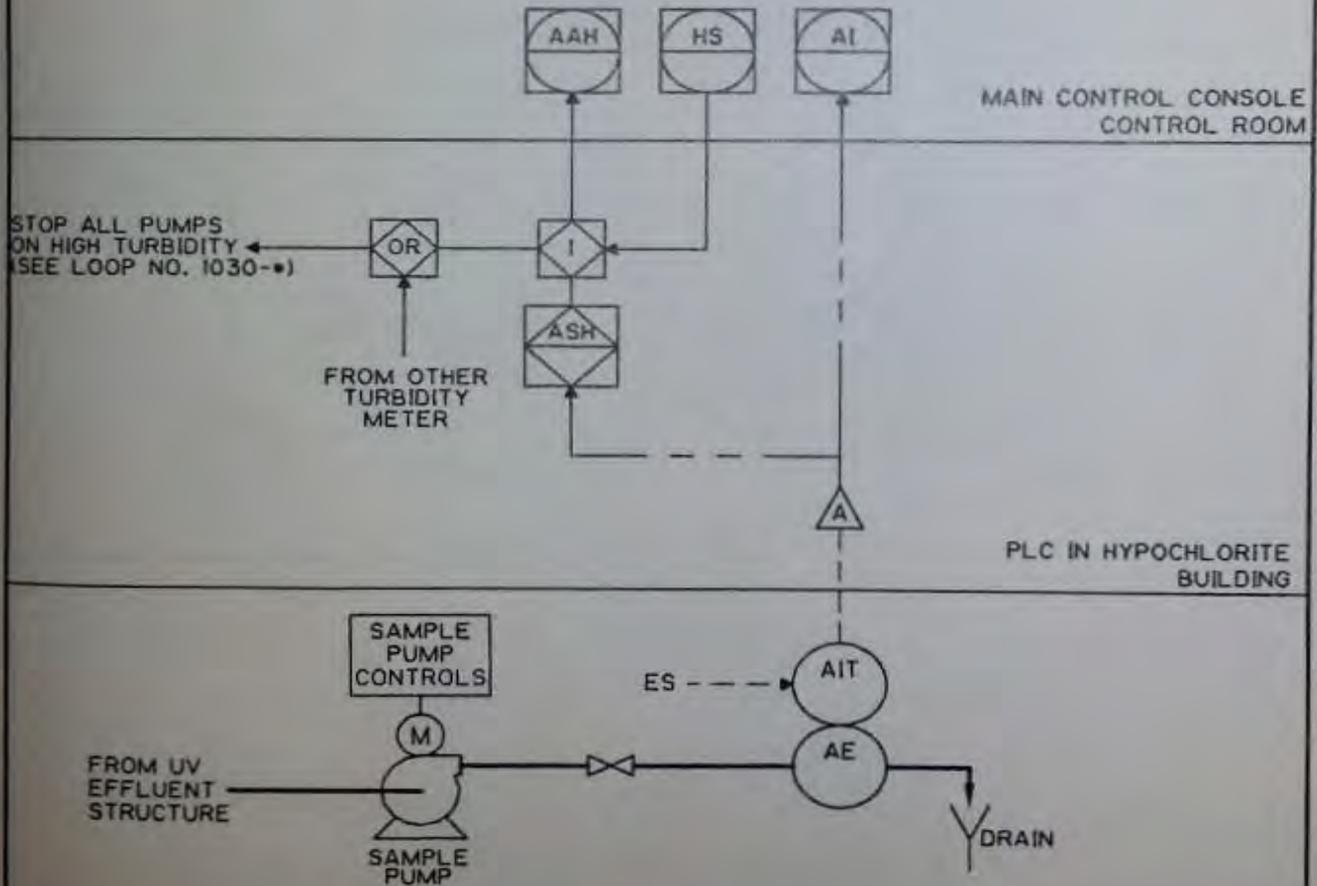
Town of Cary Reclaimed Water System
 Facility Worksheet
 MONITORING EQUIPMENT

Plans/Drawings:

ITEM	DESCRIPTION	TYPE	CRITERIA	NAME TAG/SERVICE	QTY
AE/AIT	ANALYSIS ELEMENT/ INDICATING TRANSMITTER	TURBIDITY	PROVIDE W/ BUBBLER TRAP RANGE:	RECLAIMED WATER TURBIDITY	1
ASH	ANALYSIS SWITCH HIGH	ACCESSIBLE THRU TOUCHSCREEN	SET POINT: 8.0 NTU	RECLAIMED WATER TURBIDITY HIGH	2
AAH	ANALYSIS ALARM HIGH	INITIATED THRU SOFTWARE		RECLAIMEDW WATER TURBIDITY HIGH	2
AI	ANALYSIS INDICATOR	INITIATED THRU SOFTWARE	RANGE: 0 - 50 NTU	RECLAIMED WATER TURBIDITY	2
HS	HAND SWITCH	INITIATED THRU SOFTWARE		RECLAIMED WATER ALARM LOCK OUT	2

* DENOTES (2) IDENTICAL LOOPS:
 LOOP NO. 1010-1
 LOOP NO. 1010-2

PLCS:
 TURBIDITY METER NO. 1 (EXISTING)
 TURBIDITY METER NO. 2



REFER TO DIVISION 13300, SECTION 2.06
 FOR SAMPLE PUMP SPECIFICATION

PLANT EFFLUENT WATER TURBIDITY MONITORING

LOOP NO. 1010-*

**Town of Cary Reclaimed Water System
Facility Worksheet
MONITORING EQUIPMENT**

Additional Information:

Solitax Probe

Accuracy:Turbidity: Defined according to ISO/WD 13530. Suspended Solids Less than of reading or ± 0.001 NTU, whichever is greater
Accuracy 2:Defined according to ISO/WD 13530. Turbidity Suspended Solids Less than 5 % of reading (depends on homogeneity of municipal activated sludge)
Cable Length:10 m (33 ft.) standard. Optional extension cables available in 7.6 m (25 ft.), 15.2 m (50 ft.), 30.5 m (100 ft.). Maximum total length: (328 ft.).
Calibration:Turbidity Suspended Solids:Formazin or StablCal® Standard Based on gravimetric TSS analysis with a correction factor procedure
Calibration Method:Turbidity Suspended Solids:Formazin or StablCal® Standard Based on gravimetric TSS analysis with a correction factor procedure
Certifications:CE certified to EN 61326-1, EN 61326/A1, EN 61326/A2, EN 61010-1
Construction - Sensor Body (RD 240/260):Wiper Sensor body: Silicon Stainless steel or PVC
Detection Limit:Turbidity Suspended Solids 0.001 mg/L
Diameter Sensor:(diameter x lengImmersion sensor: x (2.4 x)
Dimensions (D x L):2.36 in x 7.87 in (60 mm x 200 mm)
Flow:Flow Velocity 3 m/s (9.8 ft./s) maximum
Max. cable length Sensor-to-Controller:100
Measuring Principle:Dual beam infrared/scattered light photometer to measure turbidity. A backscatter photoreceptor to measure suspended solids
Measuring Range:Turbidity Suspended Solids to
Measuring Range Turbidity:Suspended Solids 0.001 to 4000 NTU
Mounting:Through sidewall of a pipeline using a ball valve; minimum pipe size (4 in.) in carbon or stainless steel
Operating Temperature Range:0 to 40 °C
Response Time:Initial response in 1 second
Sample Temperature:> 0 to 40 °C
Unit:Units of Measure Turbidity Suspended Solids: User selectable—g/L, mg/L, ppm, or % solids

**Town of Cary Reclaimed Water System
Facility Worksheet
MONITORING EQUIPMENT**

Additional Information:

HACH sc 100 Controller

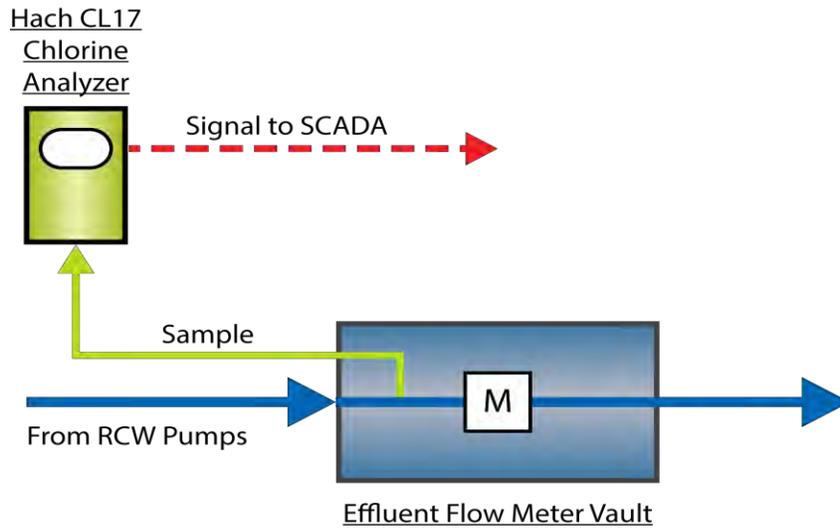
Alarm:Low alarm point, low alarm point deadband, high alarm point, high alarm point deadband, off delay, and on delay
Certifications:ETL to UL 61010A-1 and CSA C22.2 No. 1010.1
Communication:RS-232 (MODBUS): Configure and retrieve measured data for one analyzer using IBM-compatible PC RS-485 (MODBUS): Advanced communications/networking with PLC or SCADA system directly from analyzer. Profibus DPV1: Advanced communications/networking with PLC or SCADA system directly from analyzer.
Display:Graphic LCD, 128 x 64 pixels with LED backlighting
Enclosure Rating:NEMA 4X/IP65
Mounting:Surface, panel, and pipe (horizontal and vertical)
Operating Humidity:0 to 95% relative humidity, non-condensing
Operating Temperature Range:-20 to 60 °C
Outputs:Two analog 4-20 mA, maximum impedance 500 Ohms, optional digital network connection
Power Requirements (Hz):50/60 Hz
Power Requirements (Voltage):100 - 230 V AC
Relays:Three SPDT, user-configurable contacts rated 100 to 230 Vac, 5 Amp resistive maximum

**Town of Cary Reclaimed Water System
Facility Worksheet
MONITORING EQUIPMENT**

Facility: South Cary Chlorine Analyzer
Date: 2/28/13 **Inspected By:** JSG

Information:
HACH CL17 Chlorine Analyzer
Dosage sp in SCADA paces feed pumps -no interface control to pumps.

Schematic:



South Cary Chlorine Analyzer

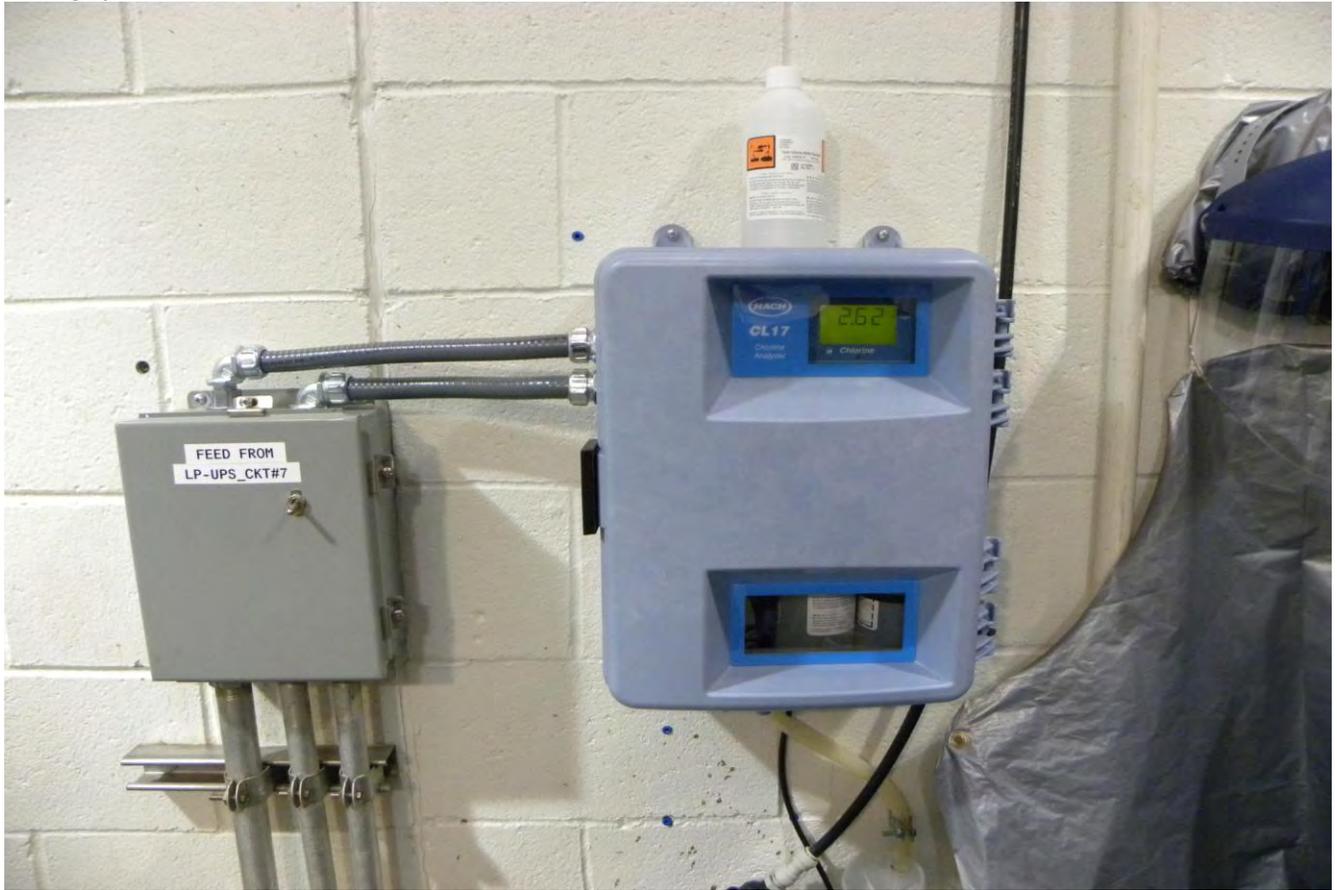
Year Constructed: 2001
Manufacturer: HACH

Overall condition: Excellent Good Fair Poor Needs Repair Needs Replacement

Drawing Provided Yes No

Town of Cary Reclaimed Water System
Facility Worksheet
MONITORING EQUIPMENT

Photographs:



**Town of Cary Reclaimed Water System
Facility Worksheet
MONITORING EQUIPMENT**

Plans/Drawings:

ITEM	DESCRIPTION	TYPE	CRITERIA	NAME TAG/SERVICE	QTY
AE/ AIT	ANALYSIS ELEMENT/ INDICATING TRANSMITTER	CHLORINE RESIDUAL	RANGE: 0 - 10 MG/L	RECLAIMED WATER RESIDUAL CL ₂ MONITORING	1
AIR	ANALYSIS INDICATING RECORDER	INITIATED THRU SOFTWARE	RANGE: 0 - 10 MG/L	RECLAIMED WATER RESIDUAL CL ₂ MONITORING	1
AAH	ANALYSIS ALARM HIGH	INITIATED THRU SOFTWARE		RECLAIMED WATER RESIDUAL CL ₂ HIGH	1
ASH	ANALYSIS SWITCH HIGH	ACCESSIBLE THRU TOUCHSCREEN	SETPOINT: 3.0 MG/L	RECLAIMED WATER RESIDUAL CL ₂ HIGH	1
AAL	ANALYSIS ALARM LOW	INITIATED THRU SOFTWARE		RECLAIMED WATER RESIDUAL CL ₂ LOW	1
ASL	ANALYSIS SWITCH LOW	ACCESSIBLE THRU TOUCHSCREEN	SETPOINT: 1.0 MG/L	RECLAIMED WATER RESIDUAL CL ₂ LOW	1

AAL
AIR
AAH

MAIN CONTROL CONSOLE
CONTROL ROOM

ASL
ASH

PLC IN HYPOCHLORITE
BUILDING

FROM RECLAIMED WATER PIPING → [Valve] → [Valve] → (AIT) → (AE) → DRAIN

ES → (AIT)

RECLAIMED WATER RESIDUAL CL₂ MONITORING

LOOP NO. 1045

Town of Cary Reclaimed Water System
Facility Worksheet
MONITORING EQUIPMENT

Additional Information:

Accuracy: $\pm 5\%$ or ± 0.03 mg/L (ppm) as Cl_2 , whichever is greater
Air Purge: 0.1 cfm (0.17 m³/h) instrument quality air at max. 20 psig (ca. 1.4 bar)
Alarm: Relay Outputs
Cycle Time: 2.5 minutes
Depth: (13.5 x 16.5 x 7.5 in.)
Dimensions (H x W x D): 37.1 in x 16.5 in x 7.5 in (943 mm x 419 mm x 191 mm)
Display: LCD, 3 digit measurement readout and six-character alphanumeric scrolling text line
Inlet: polyethylene tube, quick-disconnect fitting
Interferences: Other oxidizing agents such as bromide, chlorine dioxide, permanganate and ozone will cause a positive interference. Hexavalent chromium will cause a positive interference: 1 mg/L Cr^{6+} = approximately 0.02 mg/L as Cl_2 . Hardness must not exceed 1,000 mg/L as $CaCO_3$.
Light Source: Class 1 LED (light emitting diode) with a peak wavelength of 520 nm; 50,000 hours estimated minimum life
Lower Limit of Detection (LOD): 0.03 mg/L (ppm)
Mounting: Wall mount
Operating Humidity: 90% at max. 40 °C
Operating Temperature Range: 5 to 40 °C
Power Requirements (Hz): 60 Hz
Power Requirements (Voltage): 102 - 115/230 V AC
Pressure Limit: Inlet Pressure to Sample Conditioning 1.5 bar
Range: 0 - 5 mg/L free or total residual chlorine
Ranges: 0 - 5 mg/L free or total residual chlorine
Repeatability: ppm 0.01 or 3.0 % , whichever is greater
Sample Flow Rate: 200 - 500 mL per minute minimum required
Sample Temperature: 5 to 40 °C (41 to 104°F)

**Town of Cary Reclaimed Water System
Facility Worksheet
MONITORING EQUIPMENT**

Facility: South Cary Effluent Flow Meter

Date: 2/28/13 **Inspected By:** JSG

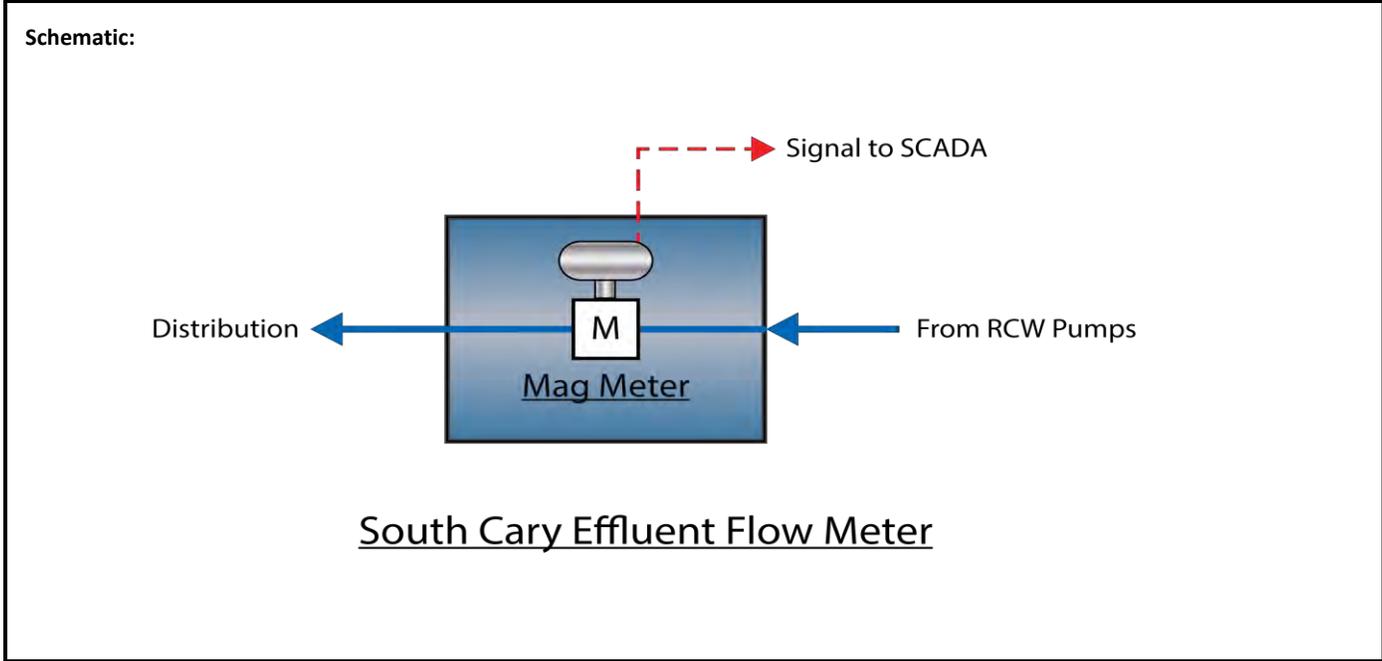
Information:

KROHNE
Aqua 490K/D/HART/6
AO4 22391 FM DN2
Q: 0-1000 us Gal/Min
I:4-20 MA

Measures Flow of Plant Process Water to Dryers and Thickeners.

KROHNE 8" Effluent Meter
KROHNE Signal Converter IFC 010 F
IFS 4000 E/6
A-0012607
DN 200 8"-H-V4A PN- 150 PSI

Measures flow to the RCW Distribution System



Year Constructed: 2012

Manufacturer: KROHNE

Overall condition: Excellent Good Fair Poor Needs Repair Needs Replacement

Drawing Provided ___ Yes x No

Town of Cary Reclaimed Water System
Facility Worksheet
MONITORING EQUIPMENT

Photographs: Plant Process RCW



Town of Cary Reclaimed Water System
Facility Worksheet
MONITORING EQUIPMENT

Information: KROHNE Meter 8"



**Town of Cary Reclaimed Water System
Facility Worksheet
STORAGE TANKS**

Facility: South Cary Reclaimed Water Storage Tank

Date: 2/28/13

Inspected By: JSG

Tank Information:

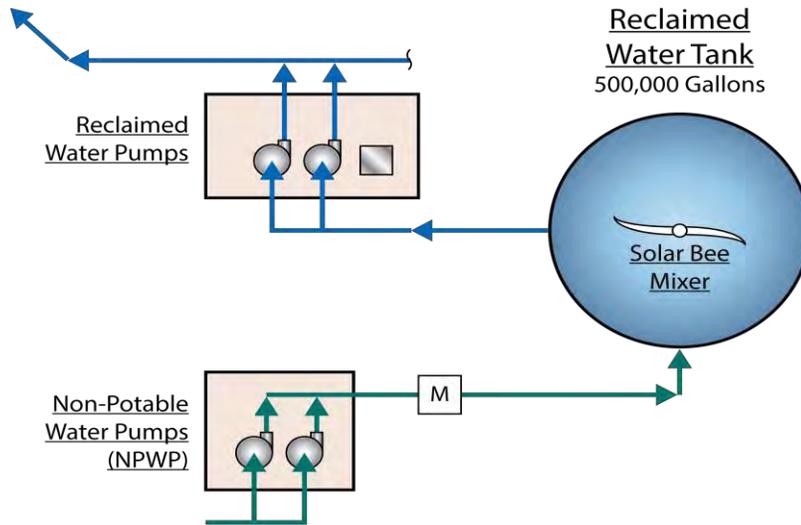
Type of Tank: Prestressed Concrete

HWL Alarm 23 ft

Set Points and on/off control: RCW Tank Lead 20.0 ft /18.0 ft
RCW Lag 18.0 ft/16.0 ft

LWL Alarm 12 ft

Tank Schematic:



South Cary Reclaimed Water Storage Tank

Year Constructed: 2012

Manufacturer: PreCon Corporation

Overall condition: Excellent Good Fair Poor Needs Repair Needs Replacement

Drawing Provided Yes No

Tank Diameter: 60 feet

Ground Elevation: 301.93 feet m.s.l.

Tank Height: 23.7 feet

Ground to Overflow: 23.6 feet

Head Range: 23.6 feet

Total Volume: 0.5 MG

Source of Information: as-built, visual inspection
(model, as-built, visual inspection, verbal)

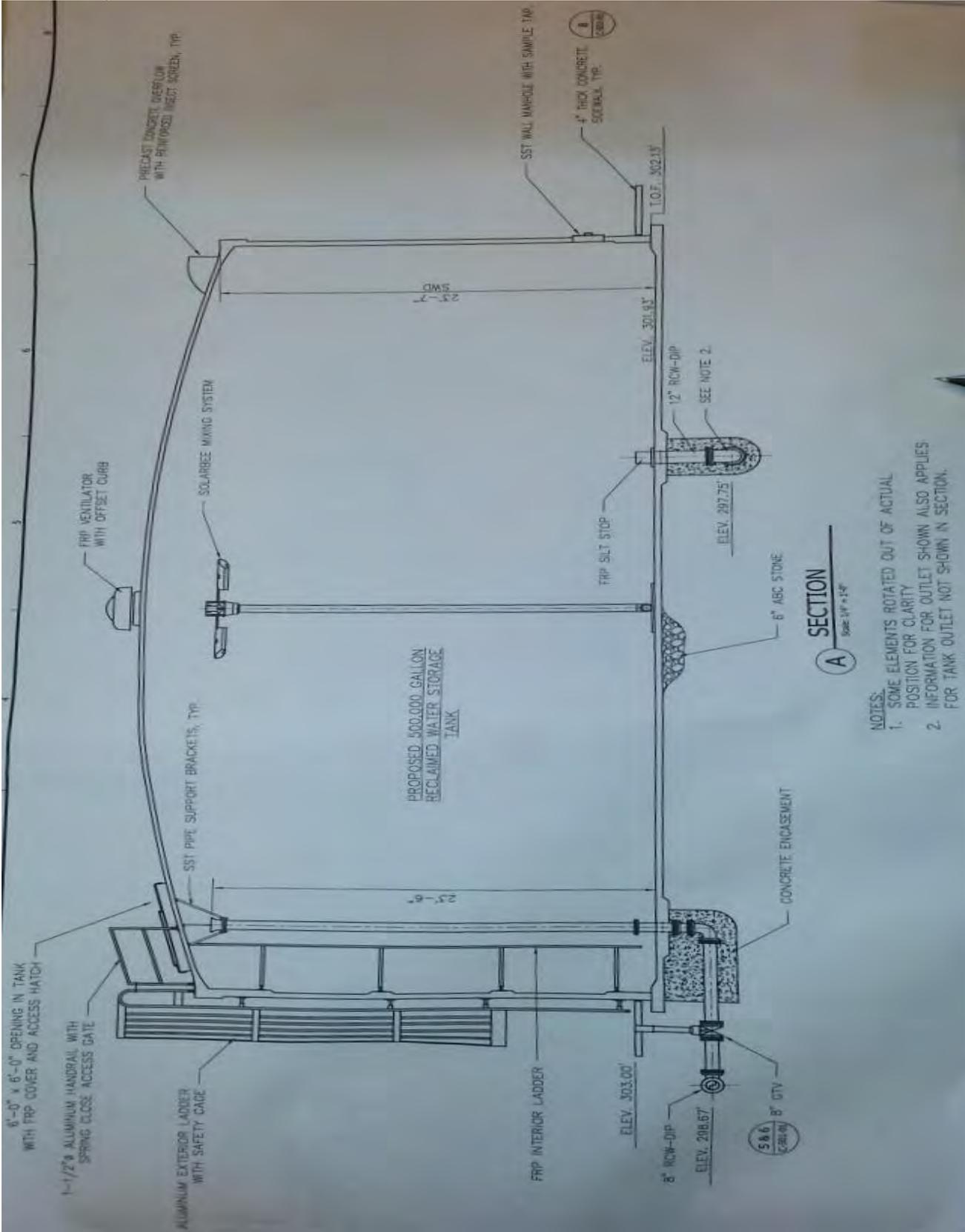
Town of Cary Reclaimed Water System
Facility Worksheet
STORAGE TANKS

Photographs:



**Town of Cary Reclaimed Water System
Facility Worksheet
STORAGE TANKS**

Plans/Drawings:



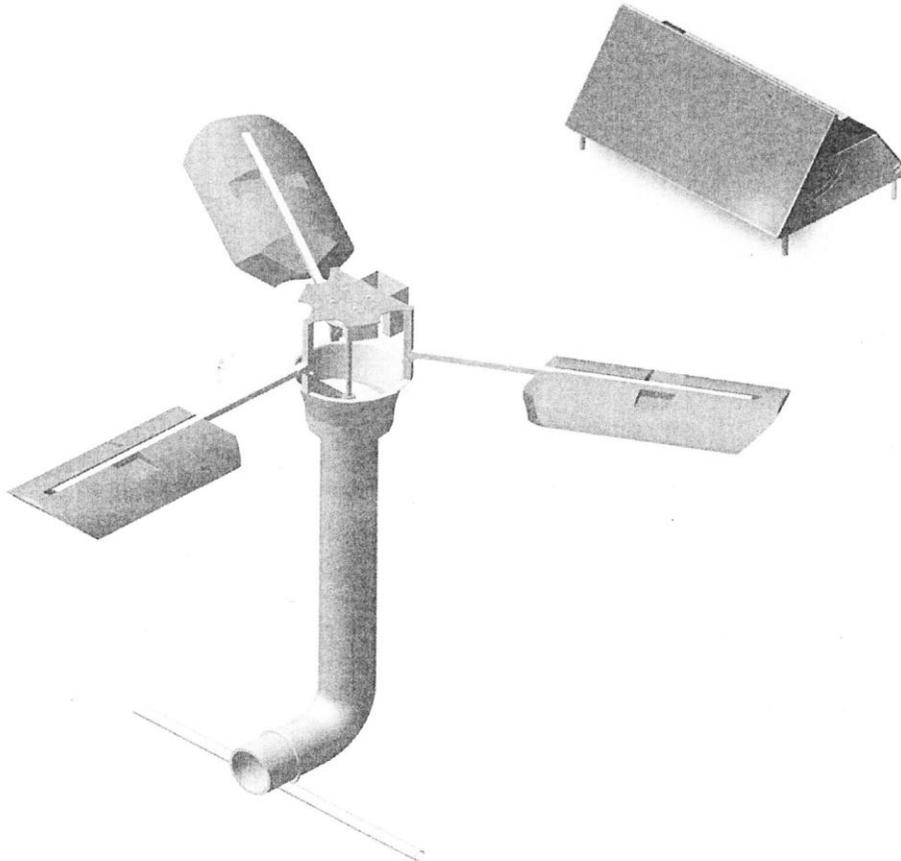
Town of Cary Reclaimed Water System
Facility Worksheet
STORAGE TANKS

Additional Information:
SOLARBEE Mixing System
Model No. SB500PWc V18

SolarBee®
Circulating the World's Water

Main Office and Service Center
SolarBee, Inc.
3225 Hwy 22, Dickinson, ND 58601
Ph +1 701 225 4495 • +1 866 437 8076 • Fax +1 701 225 0002

MODEL SB500PWc v18



500PWcV18-Model_20100602

© 2010 SolarBee, Inc.

**Town of Cary Reclaimed Water System
Facility Worksheet
STORAGE TANKS**

Additional Information:

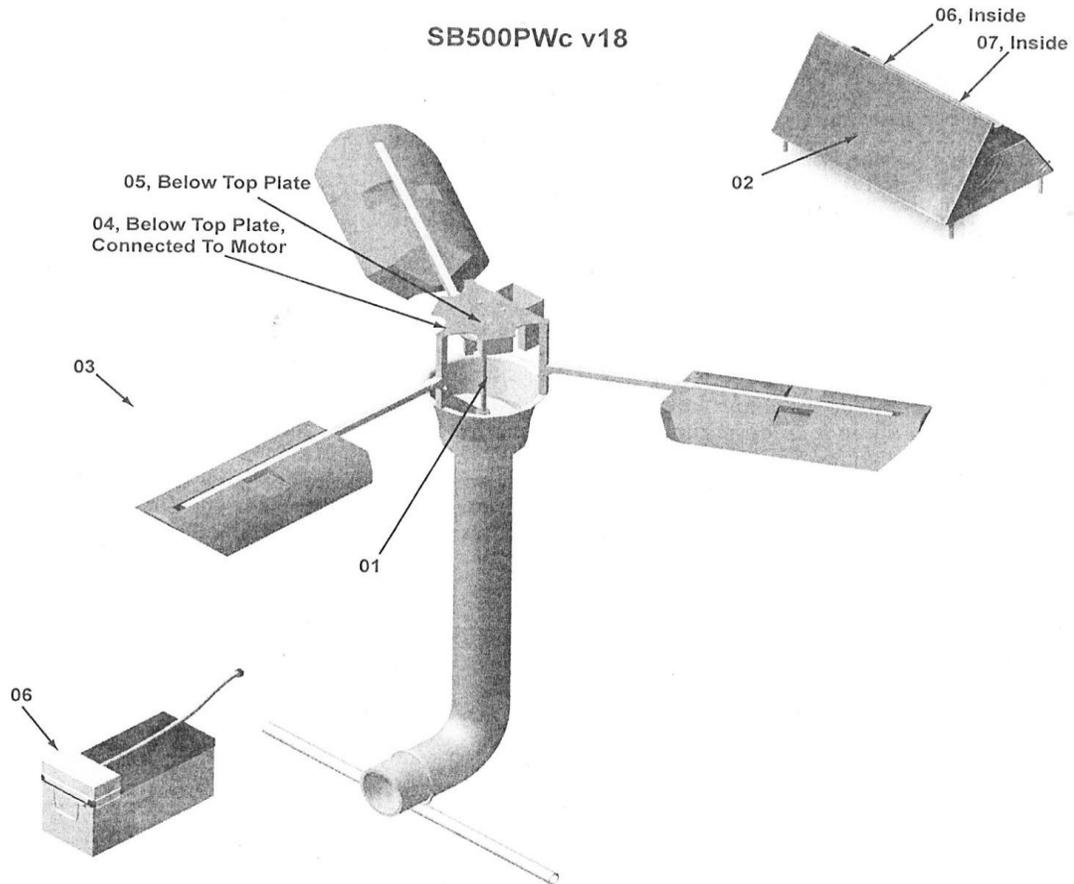


Main Office and Service Center
SolarBee, Inc.
3225 Hwy 22, Dickinson, ND 58601
Ph +1 701 225 4495 • +1 866 437 8076 • Fax +1 701 225 0002

PARTS DIAGRAM

NO.	PART #	DESCRIPTION
01	22281012	ROTATING ASSEMBLY
02	14283080	SOLAR PANEL (WIRED)
03	28010000	FLOAT ASSEMBLY
04	14013020	MOTOR CONTROLLER CORD
05	20504700	BRUSHLESS MOTOR
06	14285212	BATTERY
07	14300000	EXTERNAL CONTROLLER

SB500PWc v18

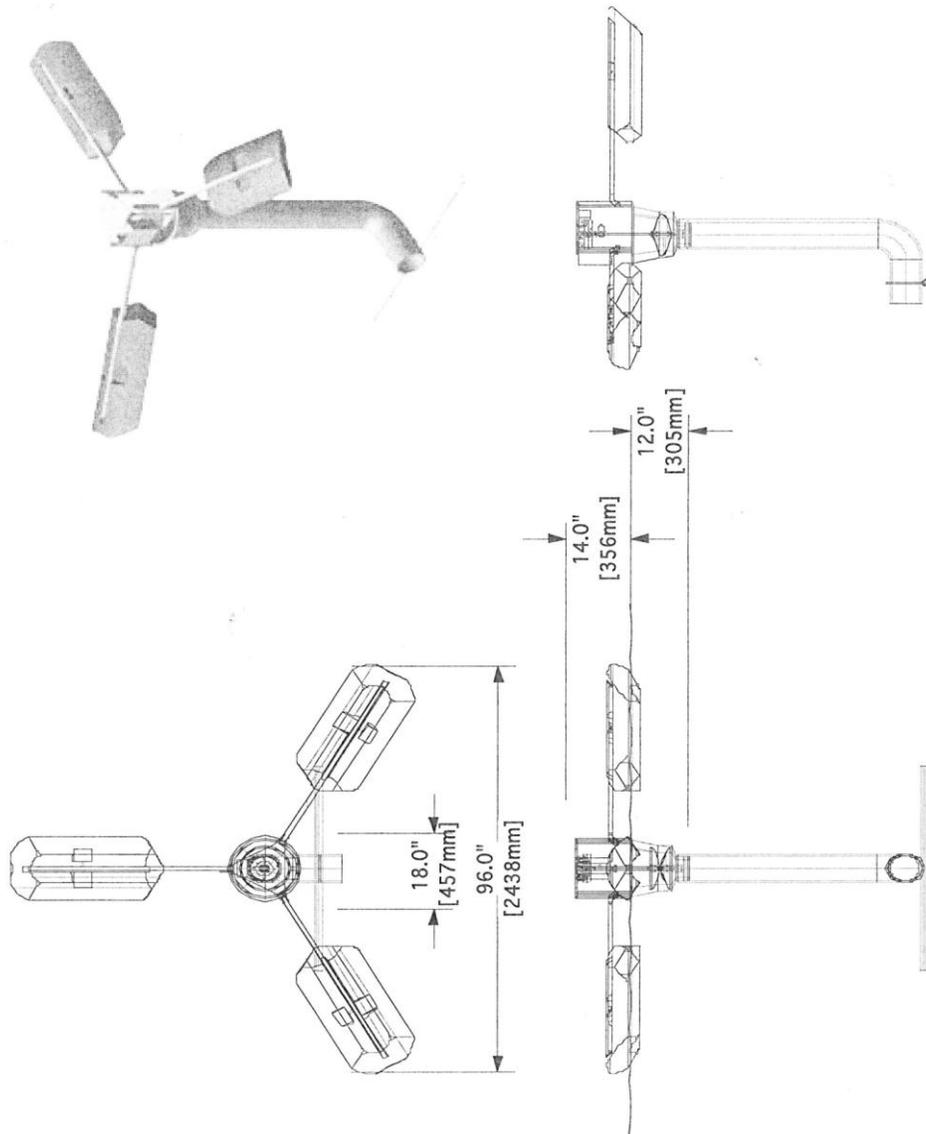


500PWcV18-Parts_20100602

© 2010 SolarBee, Inc.

**Town of Cary Reclaimed Water System
Facility Worksheet
STORAGE TANKS**

Additional Information:
SOLARBEE Mixing System
Model No. SB500PWc V18



MANUFACTURER'S INFORMATION <small>THE MANUFACTURER'S INFORMATION IS FOR INFORMATION ONLY AND IS NOT TO BE USED FOR CONSTRUCTION. THE MANUFACTURER'S INFORMATION IS NOT TO BE USED FOR CONSTRUCTION. THE MANUFACTURER'S INFORMATION IS NOT TO BE USED FOR CONSTRUCTION.</small>			
<small>SEE SPECIFICATION SHEET FOR MATERIALS AND FINISHES.</small>			
TITLE SB500PWc v18 Overall Dimension		PART NO. NA	
SCALE 1:30		DATE 12/22/2009	
DATE 12/22/2009		FILE NAME 500PWcV18.DWG_20091222	

**Town of Cary Reclaimed Water System
Facility Worksheet
STORAGE TANKS**

Additional Information:
SOLARBEE Mixing System
Model No. SB500PWc V18

Patent Pending



SB500PWc v18 FEATURES

Technology Description:	Floating, solar powered, circulation equipment for potable water reservoirs. Day/night operation on solar only by utilizing a battery to store excess daytime power for nighttime operation.
Minimum Access Opening / Machine Size/Weight:	Machine can be installed through 18 inch (46 cm) diameter opening. Assembled machine is 10 feet (3.0 meter) in diameter and weighs 250 pounds (115 kg).
Materials of Construction NSF/ANSI Standard 61:	316 stainless steel construction. Foam-filled high-density polyethylene (HDPE) floats. Thermoplastic rubber intake hose. HDPE strainer. The SB500PWc is NSF/ANSI Standard 61 Listed, includes NSF/ANSI 61, Annex G.
Drive System:	High torque, direct drive (no gearbox), low voltage brushless D.C. motor.
Power Supply/Control System:	Photovoltaic (PV) Solar Panel, Battery and Electronic Controller are mounted on rack outside.
PV Solar Panels	80-watt PV solar panel. Battery storage for day/night operation.
Electronic Controller	Digital, solid-state controller, mounted in weather-tight (NEMA 4X) enclosure with internally fused disconnect. SCADA output through RS-232 Serial Communication (Modbus RTU), DB9 male connection point inside enclosure. Wireless options available, not included.
Wiring	Corrosion-resistant, industrial cord with molded watertight connectors that are indexed to prevent improper wiring. Low voltage in reservoir, less than 36 VDC.
Rotating Assembly:	Removable assembly with easy access to impeller and impeller shaft.
Flotation System:	Three floats in triangular pattern with total float buoyancy of 300 pounds (140 kg).
Fluid Intake Assembly:	Intake hose banded to bottom of structural assembly.
Intake Hose	20 to 100+ feet (6 to 30+ m) available in 6-inch (15.2 cm) diameter X 20 feet (6 m) sections.
Torque Bar, Chemical Injection	Torque bar placed at bottom end of hose, positions open end of hose at bottom floor of reservoir.
Chlorine Boosting	Chlorine boost hose, accessible at top of reservoir spans down and connects to intake for fast chlorine dispersion during in-reservoir boosting.
Minimum Water Depth:	At depths below 2 feet (0.6 meters), the impeller will be out of the water and the machine will stop circulating water. No damage to machine if ran dry in shallow water.
Accessories Available:	(1) Portable Chlorine Boost System, (2) LED RPM Indicator (3) Supplemental Power Kit, and (4) Wireless SCADA Kit
Warranty:	Expect 25-year life, minimal maintenance. Limited 2-year parts and labor warranty. Limited 25 year photovoltaic module manufacturer performance warranty and 10 year motor warranty.

Subject to change without notice.

SolarBee, Inc • 3225 Hwy 22 • Dickinson, ND 58601
Ph +1 701 225 4495 • Fax +1 701 225 0002 • 866 437 8076 • www.solarbee.com
© 2010 SolarBee, Inc. • Dickinson, ND

500PWcv18-FEATURE_20100423

Town of Cary Reclaimed Water System
Facility Worksheet
STORAGE TANKS

Additional Information:

NPWP Pumps maintain RCW tank level.

Set Points:

Lead Start - 17.0 feet

Lead Stop - 20.0 feet

Lag Start - 16.0 feet

Lag Stop - 18.0 feet



**Town of Cary Reclaimed Water System
Facility Worksheet
BULK FILL STATION**

Facility: South Cary WRF Bulk Reclaimed Water Fill Station

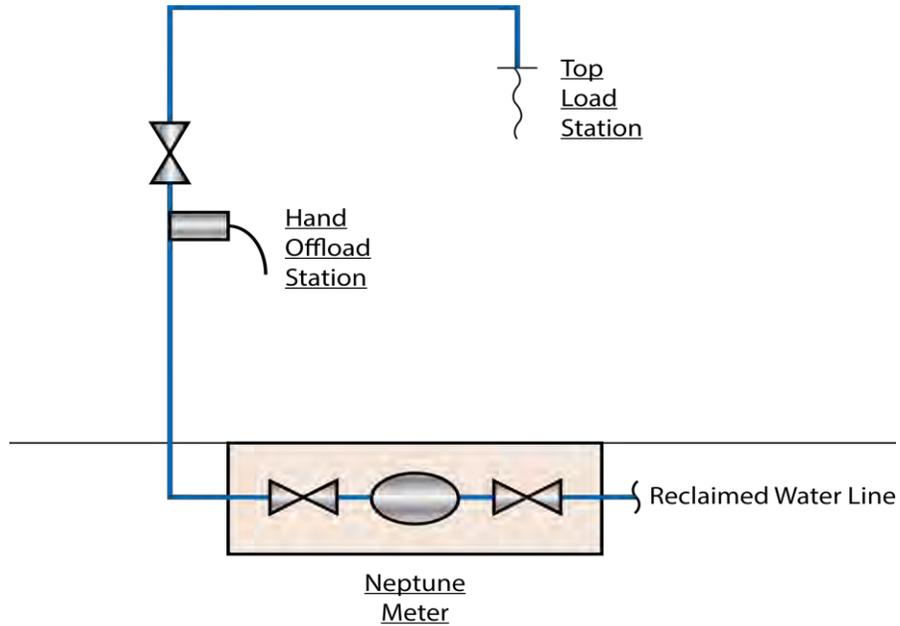
Date: 2/28/13

Inspected By: JSG

Information:

Neptune 3" Water Meter for Bulk loading
Readings taken before and after loading.

Schematic:



South Cary Bulk Reclaimed Water Fill Station

Year Constructed: 2001

Overall condition: Excellent Good Fair Poor Needs Repair Needs Replacement

Drawing Provided ___ Yes x No

Town of Cary Reclaimed Water System
Facility Worksheet
BULK FILL STATION

Photographs:



**Town of Cary Reclaimed Water System
Facility Worksheet
BULK FILL STATION**

Additional Information:

South Cary Reclaimed Water Program

SODIUM HYPOCHLORITE TRUCK UNLOADING SEQUENCE

Initiation of truck unloading cycle is set by operator at Panelview

Screen prompts at Panelview

- A. ENTER TRUCK CONCENTRATION IN %
- B. ENTER DESIRED CONCENTRATION ADDITION TO TANK IN %

Truck operator instructions at BSCP

- A. Do not begin unloading unless READY light is on.
- B. Press BEGIN UNLOADING immediately before starting unloading.
- C. Display indicates gallons that can be unloaded.
- D. UNLOAD COMPLETE light blinking indicates prepare to stop.
- E. Stop when display reaches zero.
- F. Press UNLOAD END immediately after stopping unloading.
- G. UNLOAD COMPLETE light goes steady while system adds water.
- H. UNLOAD COMPLETE light goes off when water fill cycle is complete.

If the truck operator forgets to press UNLOAD END, the TRUCK UNLOAD OVERTIME alarm will trip after 15 minutes..

If the truck operator fills less than the gallons indicated, the PLC will recalculate the water required when UNLOAD END is pressed.

If the truck operator fills more than the gallons indicated, the OVERFILL light will flash and send an alarm to the Panelview and the PLC will recalculate the water required when UNLOAD END is pressed. Proper concentration will not be reached if the overfill is so severe that the water would overflow the tank, manual correction of the concentration would then be necessary. A manual OPEN WATER VALVE button may be pressed on the Panelview to add extra water if required for dilution.

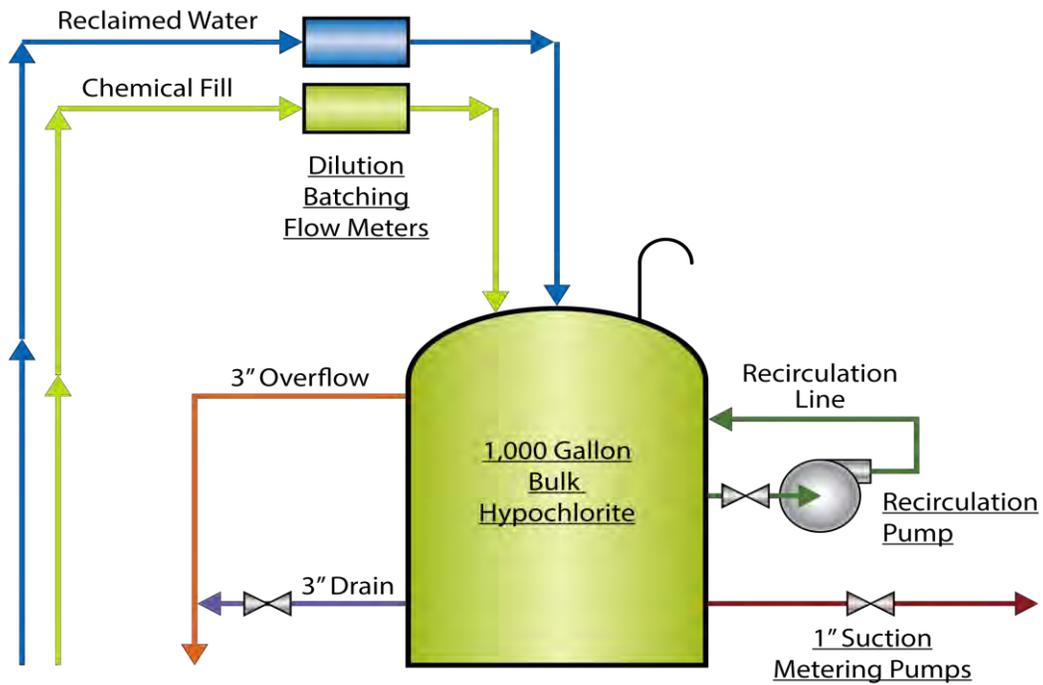
**Town of Cary Reclaimed Water System
Facility Worksheet
HYPOCHLORITE TANK**

Facility: South Cary WRF Hypochlorite Tank
Date: 2/28/13 **Inspected By:** JSG

Information:
 Southeastern Fiberglass Products Inc.
 Tank Service: 15% Sodium Hypochlorite
 Volume: 966 US Gallons
 Resin: Hetrion FR 992 W/Antimony Trioxide
 Corrosion Barrier: "C" Veil/Double Nexus Veil
 PO NO. 40139 TAG NO. T-1470

Hypochlorite Dilluted to 5% Concentration.

Schematic:



South Cary Hypochlorite Tank

Year Constructed: 2001

Overall condition: Excellent Good Fair Poor Needs Repair Needs Replacement

Drawing Provided Yes No

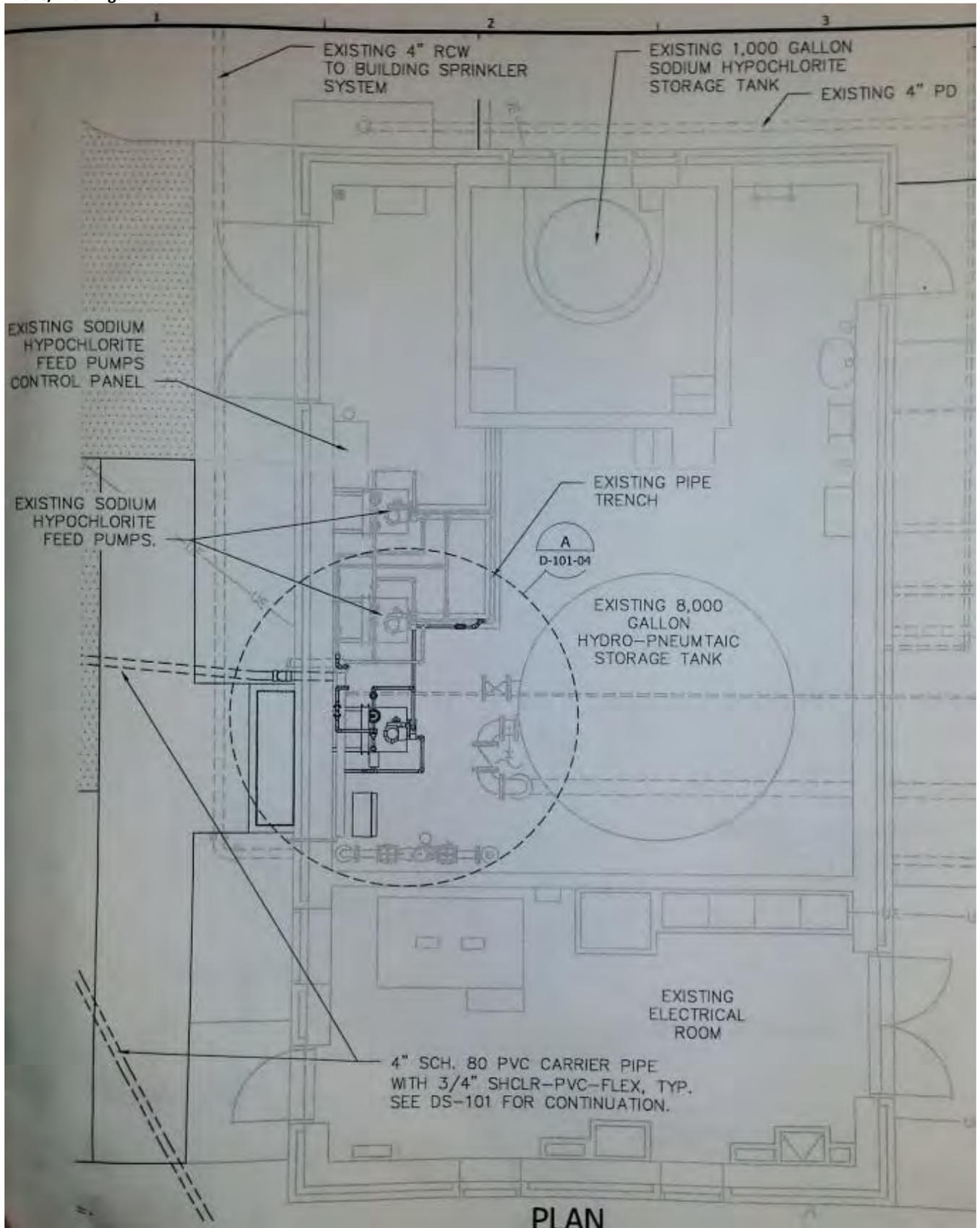
Town of Cary Reclaimed Water System
Facility Worksheet
HYPOCHLORITE TANK

Photographs:



Town of Cary Reclaimed Water System
Facility Worksheet
HYPOCHLORITE TANK

Plans/Drawings:



Town of Cary Reclaimed Water System
Facility Worksheet
HYPOCHLORITE TANK

Additional Information:
Batching System Operator Interface:

2/8/01 11:43:20 AM

A0627South Cary Reclaimed Water.PBA

Page 5

NaOCl BATCHING

<p>PERMIT TO UNLOAD TRUCK</p> <p>NaOCl</p> <p>TO ALARM HISTORY</p> <p>TO NaOCl PUMPS</p> <p>TO RECLAIMED WATER</p> <p>TO MENU</p>	<p>ENTER TRUCK CONCENTRATION</p> <p>#### GAL</p> <p>RESET</p> <p>NaOCl STORAGE TANK</p> <p>MAXIMUM FILL LEVEL</p> <p>### %</p> <p>LEVEL</p> <p>### %</p> <p>TRUCK UNLOAD</p> <p>#### GAL</p> <p>LOW LOW</p> <p>RESET</p>	<p>NaOCl ADDITION CONCENTRATIONS</p> <p>ENTER TRUCK CONCENTRATION: ##.# %</p> <p>ENTER DESIRED CONCENTRATION: ##.# %</p> <p>WATER VALVE OPEN</p> <p>NaOCl RECIRCULATION PUMP</p> <p>DISABLE</p> <p>HAND AUTO</p> <p>OFF</p> <p>RESET</p>	<p>START TIME OF DAY: ## :00 HR</p> <p>RUN TIME EACH DAY: ### MIN</p> <p>RUN TIME AFTER EACH FILL CYCLE: ### MIN</p>
---	--	--	--

**Town of Cary Reclaimed Water System
Facility Worksheet
CHEMICAL METERING PUMPS**

Facility: South Cary WRF Chemical Metering Pumps

Date: 2/28/13

Inspected By: JSG

Information: Sodium Hypochlorite Metering Pumps

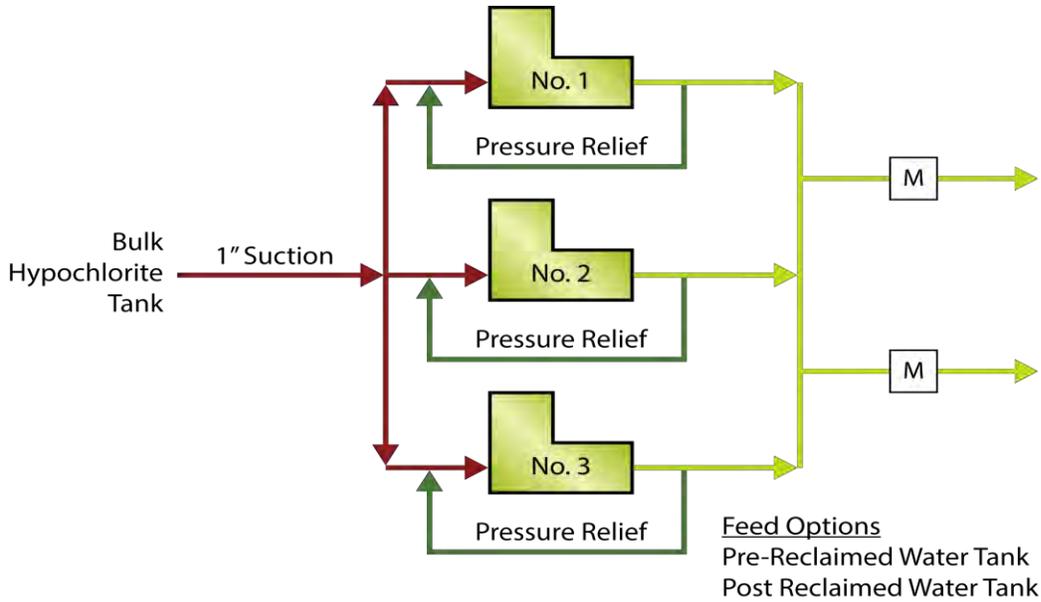
Milton Roy
Pump No. 1 & 2
Model: MGH20220CBM2SE11NN22
10 GPH
150 PSI

2001

Milton Roy
Pump No. 3
Model: MGH202X0007
10 GPH
150 PSI

2012

Schematic:



Year Constructed: 2001/2012

Overall condition: Excellent Good Fair Poor Needs Repair Needs Replacement

Drawing Provided Yes No

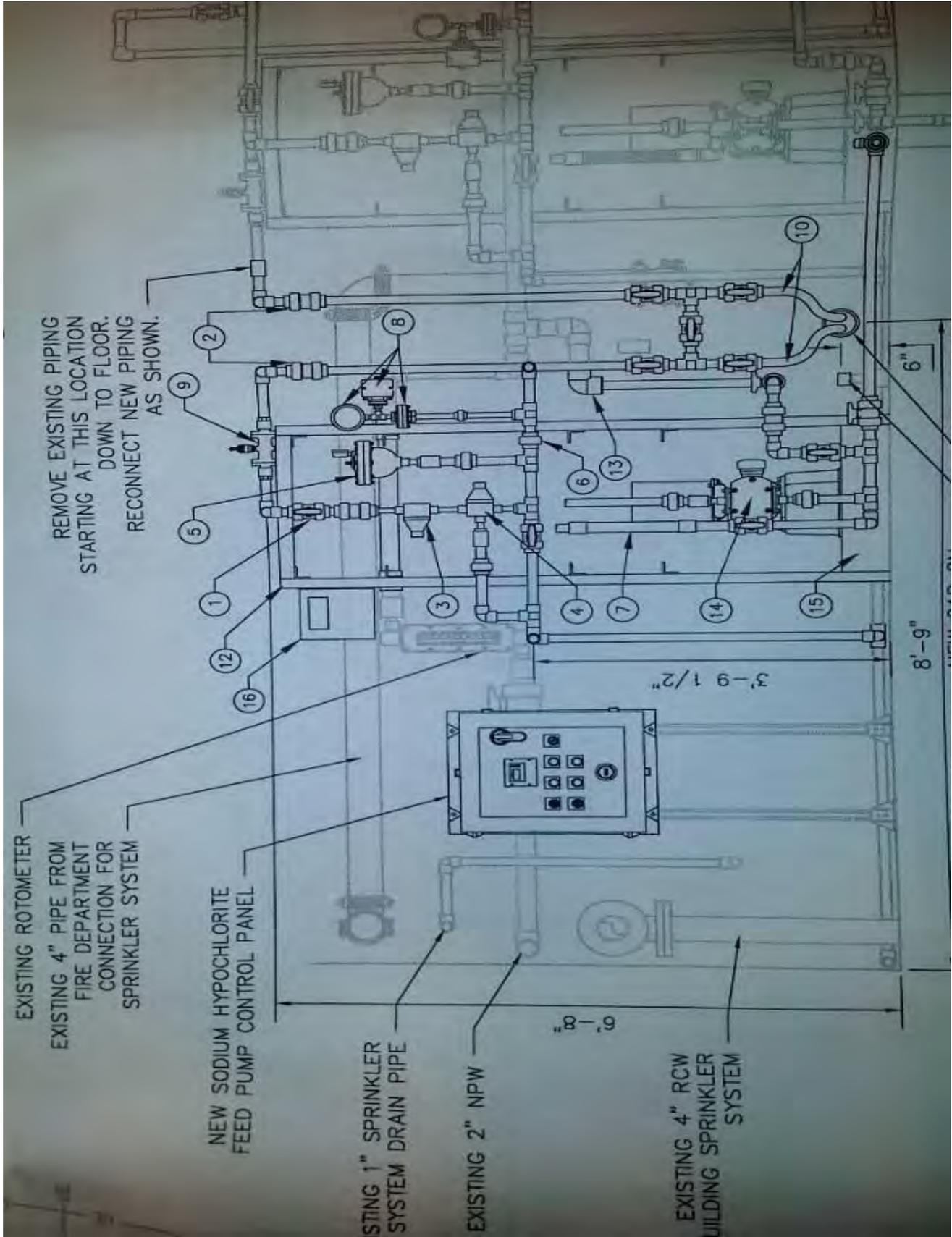
Town of Cary Reclaimed Water System
Facility Worksheet
CHEMICAL METERING PUMPS

Photographs:



Town of Cary Reclaimed Water System
Facility Worksheet
CHEMICAL METERING PUMPS

Plans/Drawings:



**Town of Cary Reclaimed Water System
Facility Worksheet
CHEMICAL METERING PUMPS**

Additional Information:

SOUTH CARY RECLAIMED WATER PROGRAM
CONTRACT 2 – PUMPS AND DISINFECTION
FACILITIES AND TRANSMISSION MAIN
TOWN OF CARY, NORTH CAROLINA

SPECIFICATION SECTION 11240
CHEMICAL FEED METERING PUMPING SYSTEMS

METERING PUMP DATA SHEET

EQUIPMENT NAME:	SODIUM HYPOCHLORITE FEED PUMPS
EQUIPMENT I.D. NUMBER:	NO. 1 & NO. 2
SERVICE:	SODIUM HYPOCHLORITE (5-16%)
PUMP MODEL NUMBER:	MGH202 20CBM2SE11NN22
PUMP SERIAL NUMBER:	0230800-01/02
RATED CAPACITY:	10.0 GPH
RATED PRESSURE:	150 PSIG
PLUNGER DIAMETER:	1-1/4 INCH
STROKING SPEED:	86 SPM
STROKE ADJUSTMENT:	MANUAL MICROMETER
LIQUID END CONNECTIONS:	1/4" NPT (MALE)

MATERIALS OF CONSTRUCTION (LIQUID END):

DIAPHRAGM HEAD:	PVC
DIAPHRAGM:	PTFE/NITRILE
CHECK VALVE BODY:	PVC
BALL CHECKS (DOUBLE):	CERAMIC
BALL SEATS:	PVC
O-RINGS SEALS:	VITON
DIMENSION DRAWING:	102-2250-000
PRODUCT DATA BULLETIN:	PD 3611

**Town of Cary Reclaimed Water System
Facility Worksheet
CHEMICAL METERING PUMPS**

Additional Information:

SOUTH CARY RECLAIMED WATER PROGRAM
CONTRACT 2 – PUMPS AND DISINFECTION
FACILITIES AND TRANSMISSION MAIN
TOWN OF CARY, NORTH CAROLINA

SPECIFICATION SECTION 11240
CHEMICAL FEED METERING PUMPING SYSTEMS

TAB 1 INDEX: SODIUM HYPOCHLORITE FEED PUMPS NO. 1 & NO. 2

METERING PUMP DATA SHEET:	MODEL MGH202 20CBM2SE11NN22
PUMP DIMENSION DRAWING:	102-2250-000
PRODUCT BULLETIN:	PD 3611 MILROYAL G METERING PUMP
PUMP NAMEPLATE DATA:	PUMP NO. 1 (S/N 230800-01) PUMP NO. 2 (S/N 230800-02)
PUMP TEST REPORTS:	PUMP NO. 1 (S/N 230800-01) PUMP NO. 2 (S/N 230800-02)
RECOMMENDED SPARES:	MODEL MGH202 20CBM2SE11NN22
INSTRUCTION MANUAL:	339-0064-000 MILROYAL "G" PUMP

**Town of Cary Reclaimed Water System
Facility Worksheet
CHEMICAL METERING PUMPS**

Additional Information:

SOUTH CARY RECLAIMED WATER PROGRAM
CONTRACT 2 – PUMPS AND DISINFECTION
FACILITIES AND TRANSMISSION MAIN
TOWN OF CARY, NORTH CAROLINA

SPECIFICATION SECTION 11240
CHEMICAL FEED METERING PUMPING SYSTEMS

HYPOCHLORITE FEED PUMP NO. 1
FACTORY PERFORMANCE TEST REPORT

Milton Roy Company
Flow Control Division
Ivyland, Pa. 18974

PUMP TEST REPORT

Type: **Milroyal GB**
Serial Number: **230800-1**
Model Number: **MGH202-20CBM2SE11NN22**

RATED FLOW

10	G.P.H. @	150 P.S.I.
37.85	Liters/hr @	10.55 kg/sq. cm.
37.85	Liters/hr @	10.34 Bar

TEST RESULTS

Tested with water, adequate flooded suction
Average Flow = **13.488** U.S. gal./hr
51.05 Liters/hr.
Repetitive Accuracy = **99.83%**

Motor Data

Manufacturer: **Reliance**
Horsepower: **1.0**
Volts: **90** DC
Hertz: **60**

Date: January 19, 2001
Technician: BOB GARTNER
Test Station: 5

Notes :

Town of Cary Reclaimed Water System
Facility Worksheet
CHEMICAL METERING PUMPS

Additional Information:



MILTON ROY
AMERICAS

Milroyal G Metering Pump Data Sheet

Simplex metering pumps totally enclosed, lubricating, Hydraulic actuated diaphragm design, controlled volume pump.

EQUIPMENT NAME:	Sodium Hypochlorite Pump
EQUIPMENT TAG NUMBERS:	N/A
PUMP MODEL NUMBER:	MGH202X0007
PUMP SERIAL NUMBER:	N/A
RATED MAXIMUM CAPACITY:	10 GPH
ACTUAL MINIMUM FLOWRATE:	1.0 GPH
RATED PRESSURE:	150 PSIG (MAXIMUM)
OPERATING PRESSURE:	150 PSIG
INTERNAL RELIEF VALVE SET PRESSURE:	175 PSIG (25 PSI ABOVE DISCHARGE SYSTEM PRESSURE)
STROKING SPEED:	86 SPM
ACTUAL TURNDOWN:	10:1
STROKE ADJUSTMENT:	Manual Micrometer
STROKE LENGTH:	0.47 INCHES
FRAME:	Milroyal G Simplex
CONNECTION TYPE/SIZE:	1/4" FEMALE NPT - SUCTION 1/4" FEMALE NPT - DISCHARGE
LIQUID END TYPE:	PVC Head - Hydraulic Actuated Diaphragm
PUMP WEIGHT (INCLUDING MOTOR):	129 LBS
MOTOR SIZE/TYPE:	1 1/2 HP, 1800 RPM, 180 VDC, SCR, TEFC

Town of Cary Reclaimed Water System
Facility Worksheet
CHEMICAL METERING PUMPS

Additional Information:



MILTON ROY
AMERICAS

MATERIALS OF CONSTRUCTION:

DIAPHRAGM:	PTFE
DIAPHRAGM HEAD:	PVC
BALL CHECKS:	Ceramic
BALL SEATS:	PVC
CHECK VALVE BODY:	PVC
CHECK VALVE O-RING:	Viton
PRODUCT BULLETIN:	PD3611
INSTRUCTION MANUAL:	339-0064-000 – PUMP DRIVE AND LIQUID END
SPARE PARTS KIT:	RPM-062

**Town of Cary Reclaimed Water System
Facility Worksheet
CHEMICAL METERING PUMPS**

Additional Information:

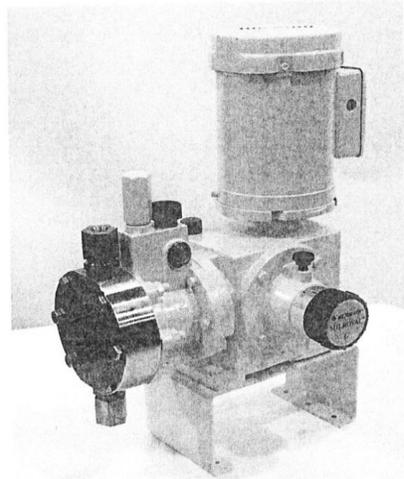


Milroyal G
PD 3611
Issued 8/6/04

MILROYAL G METERING PUMPS

Hydraulically Actuated Diaphragm Liquid End

The robust Milroyal G™ metering pump doses all traditional liquids used in water treatment and industrial processes including: acids, bases, coagulants, chlorinated products, and many others. Designed for ease of maintenance and start-up, the Milroyal G features Milton Roy's advanced hydraulically actuated High Performance Diaphragm (HPD) liquid end coupled to a durable variable eccentric drive. The absence of contour plates in this liquid end results in "straight-thru" flow ideal for handling polymers and slurries. A unique tri-mode hydraulic system valve allows for purging of any entrapped gases in the hydraulic oil without disturbing the relief valve setting. Also integral to the liquid end is a view port for visual indication of a relief condition in the hydraulic system. The smooth sinusoidal flow produced by the variable eccentric drive minimizes flow pulsations and mechanical shock to system components.



Product Features

- HPD liquid end design eliminates contour plates.
- Double diaphragm w/leak detection option available.
- Liquid End Materials: PVC, PVDF, 316SS, Alloy 20.
- High viscosity and slurry liquid end options.
- NEMA and IEC motor options.
- Integral tri-mode valve in hydraulic oil system: automatic air bleed, safety/relief valve, air purge button.
- View port provides visual indication of tri-mode valve operation.
- Non-lost motion drive design minimizes flow pulsations and mechanical shock.
- Optional AC & DC variable speed drives available for automatic control from a 4-20 mA signal.
- Optional Electronic capacity control (stroke length control) from a 4-20 mA signal.

Plunger Diameter	Gear Code	SPM @		GPH @		Max PSI		LPH @		Max BAR	
		60 Hz	50 Hz	60 Hz	50 Hz	Metal	Plastic	60 Hz	50 Hz	Metal	Plastic
1 1/4"	40	43	36	5	4	600		19	16	41	
	20	86	72	10	8			38	32		
	14	120	102	14	12			53	44		
	10	173	144	20	17			76	63		
1 3/4"	40	43	36	11	9	300	150	42	35	21	10
	20	86	72	22	18			83	69		
	14	120	102	32	27			121	101		
	10	173	144	45	38			170	142		
2 1/2"	40	43	36	22	18	150		83	69	10	
	20	86	72	45	38			170	142		
	14	120	102	64	53			242	202		
	10	173	144	90	75			341	284		
3"	40	43	36	32	27	100	100	121	101	7	7
	20	86	72	65	54			246	205		
	14	120	102	92	77			348	290		
	10	173	144	130	108			492	410		

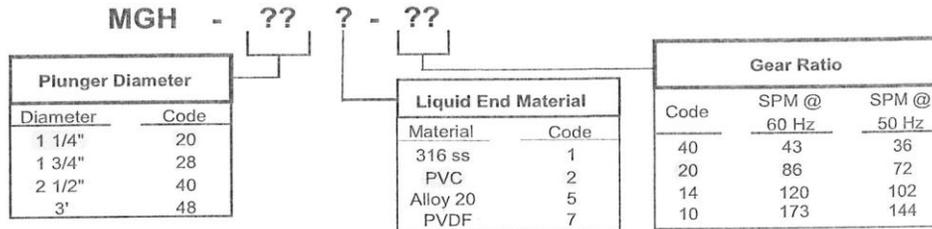
**Town of Cary Reclaimed Water System
Facility Worksheet
CHEMICAL METERING PUMPS**

Additional Information:

Milroyal G Metering Pump

Product Selection Code

Actual product code will include additional information describing options selected

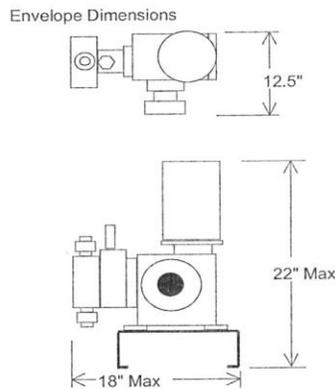
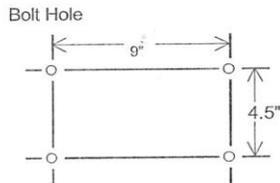


Materials of Construction

Liquid End Primary Mat'l	Diaphragm Head	Check Valves	Ball Checks	Ball Seats	Diaphragm	Wetted Seals
PVC	PVC	PVC	Ceramic	PVC	PTFE/Nitrile*	Viton
316SS	316SS	316SS	316SS	316SS		
Alloy 20	Alloy 20	Alloy 20	Alloy 20	Alloy 20		
PVDF	PVDF	PVDF	Ceramic	PVDF		

* Diaphragm is PTFE/Nitrile Composite. Only PTFE is in contact with the process fluid.

Dimensions



Available Options Include:

- Electronic Stroke Length Adjustment (4-20 mA input signal)
- Double Diaphragm
- Various Motors and Variable Speed Drives
- Slurry Check Valves
- Process Fluid Air Purge
- Flanged Connections
- Diaphragm Rupture Detection System
- NPT or BSP Piping Connections
- High Viscosity Check Valves
- Modifications per Customer Requirements

Milton Roy Company - Offices and Representatives Worldwide

Headquarters:
Milton Roy Company
201 Ivyland Road,
Ivyland, PA USA 18974

Tel: (215) 441-0800
Fax: (215) 441-8620
www.miltonroy.com

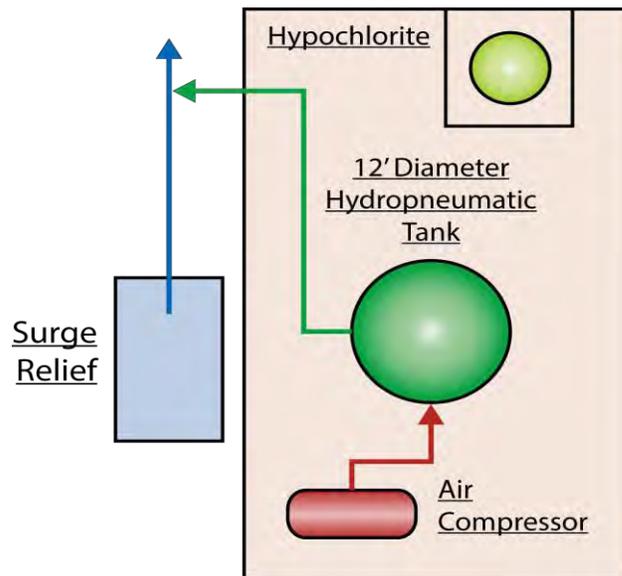
**Town of Cary Reclaimed Water System
Facility Worksheet
HYDROPNEUMATIC TANKS**

Facility: South Cary WRF Hypropneumatic Tank
Date: 2/28/13 **Inspected By:** JSG

Information:
Hypropneumatic Tank
Erected by Hydro Air
SERIAL NO. 00-139
YEAR BUILT - 2001
CAPACITY GALLONS - 8000
DIAMETER - 144"
MATERIAL - CS
WEIGHT EMPTY - 16399
WEIGHT FILLED - 83085

Quincy Duplex Air Compressor
Model - QR340DT00011
Serial No. - 5140339

Schematic:



South Cary Hypropneumatic Tank

Year Constructed: 2001

Overall condition: Excellent Good Fair Poor Needs Repair Needs Replacement

Drawing Provided Yes No

Town of Cary Reclaimed Water System
Facility Worksheet
HYDROPNEUMATIC TANKS

Photographs:



**Town of Cary Reclaimed Water System
Facility Worksheet
GENERATORS**

Facility: South Cary WRF Reclaimed Water System Generator

Date: 2/28/13

Inspected By: JSG

Information:

CATERPILLAR
MODEL-3512
1250 KVA
1000 KW STANDBY GENERATOR
480 VOLTS 1503 AMPS
FRAME 692 1800 RPM

Photographs:



Year Constructed: Tied in RCW 2012

Overall condition: Excellent Good Fair Poor Needs Repair Needs Replacement

Drawing Provided Yes x No

